

REMARKS

Claim 10 is amended, claims 21-24 are added, and claims 1-9 and 17-20 are canceled herein. Claims 10-16 and 21-24 are pending in the captioned case. Applicant reserves the right to file a divisional application on canceled claims 1-9 and 17-20.

Section 121 Restriction

In response to the Examiner's restriction requirement under 35 U.S.C. § 121, Applicants elect Group II claims 10-16 and cancel non-elected Group I claims 1-9 and 17-20.

Section 112 Rejection

Claims 10-16 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In response thereto, claim 10 is amended herein in a manner believed to obviate this rejection. Accordingly, removal of this rejection is respectfully requested.

Section 103 Rejection

Claims 10-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,124,405 to Kakivaya et al. (hereinafter "Kakivaya") in view of U.S. Patent No. 5,999,729 to Tabloski (hereinafter "Tabloski"). Although Kakivaya discloses some "key words" that are common with the present application, Kakivaya is directed to automatic initialization and class initialization methods which determines behavior in both single and multithreaded environments. Kakivaya includes deadlock detection as part of execution of the initialization code. As such, Kakivaya is primarily concerned with class dependency loops. See, e.g., Kakivaya at col. 1, lines 57-65. Kakivaya does build a "wait graph," but is looking at class dependencies.

In contrast, the present invention is concerned with deadlock detection in the context of looking for a “blockage” of the generic process network of Figure 30. As explained in the specification (p. 34 et seq.) the dispatching of map process threads is driven by the availability of data (input ports) or queue resources (output ports). Therefore, a deadlock detection method is desirable. Not surprisingly, because Kakivaya and the present invention are concerned with deadlock detection in two different contexts, their approach is similar only in the use of a few similar keywords. The office action recognized that Kakivaya did not relate to data processing systems such as described and claimed in the present application in paragraph 14 of the Office Action.

Tabloski describes a different type of deadlock detection mechanism for managing deadlock across multiple processes. Tabloski creates an execution control object on each node of the networked processing environment to communicate with the execution objects. Claim 10 does not use a control object. Tabloski does not monitor deadlock on a thread level. The execution objects communicate blockage to execution control object. In the present deadlock monitoring invention, the monitoring thread watches the data queues and does not require communication from the operators. It expands the queues if necessary based on information it has collected in the wait graph.

A key advantage to the use of deadlock detection in the present invention is to provide an automatic mechanism for dealing with different rates of flow of the tokens through the dataflow graph. Some operators need more time to process data than others or may need to aggregate data, so that they consume data at a different rate than they emit it. The queues of the present invention allow for multiple downstream consumers on the same stream of data. Tabloski does not use queues, so outbound ports in Tabloski buffer data.

Kakivaya and Tabloski address different problems as noted above, and it is not clear how they could be combined, other than the use of some common keywords. Because the present invention is not concerned with the problem confronting Kakivaya or Tabloski, it is not surprising the present invention takes a different approach. The claims as amended reflect the approach and are patentably distinct from the proposed Kakivaya/Tabloski combination.

New claims 21-24 are added to address the deadlock detection and correction aspects of the present invention. Claims 21-24 are similarly believed to be patentable over the art of record.

CONCLUSION

If the Examiner has any questions, comments or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Daffer McDaniel, LLP Deposit Account No. 50-3268.

Respectfully submitted,

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